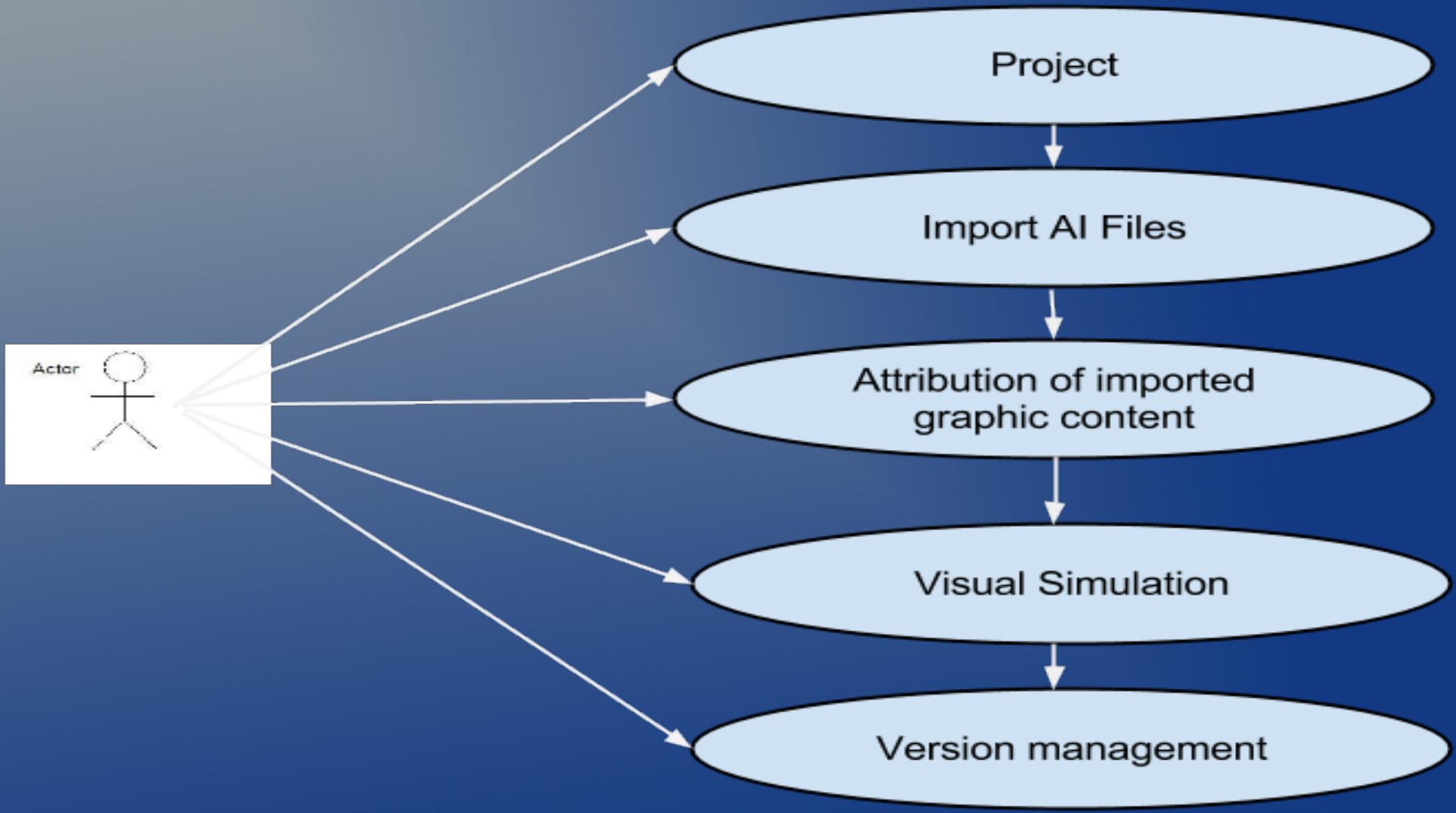
GM HMI Modeling WorkBench Usecases

HMI Development Workbench

- HMI Workbench is a tool for HMI Development. HMI Developers and Graphic designers can import AI graphics to Prototype the Screens during the early phase of development.
- This tool also helps in conducting the user clinics for early correction of the HMI, Navigation and also graphic content.
- Work bench supports editing the graphical contents with a Visual editor. This visual editor will help the designer in attribution of the graphics elements appropriately and adapt it with the contracting dynamic values.
- This visual editor feature complements the Adobe illustrator to enhance the graphic content by enabling attribution (attributes for graphic & dynamic data presentation of GM HMI Screens).

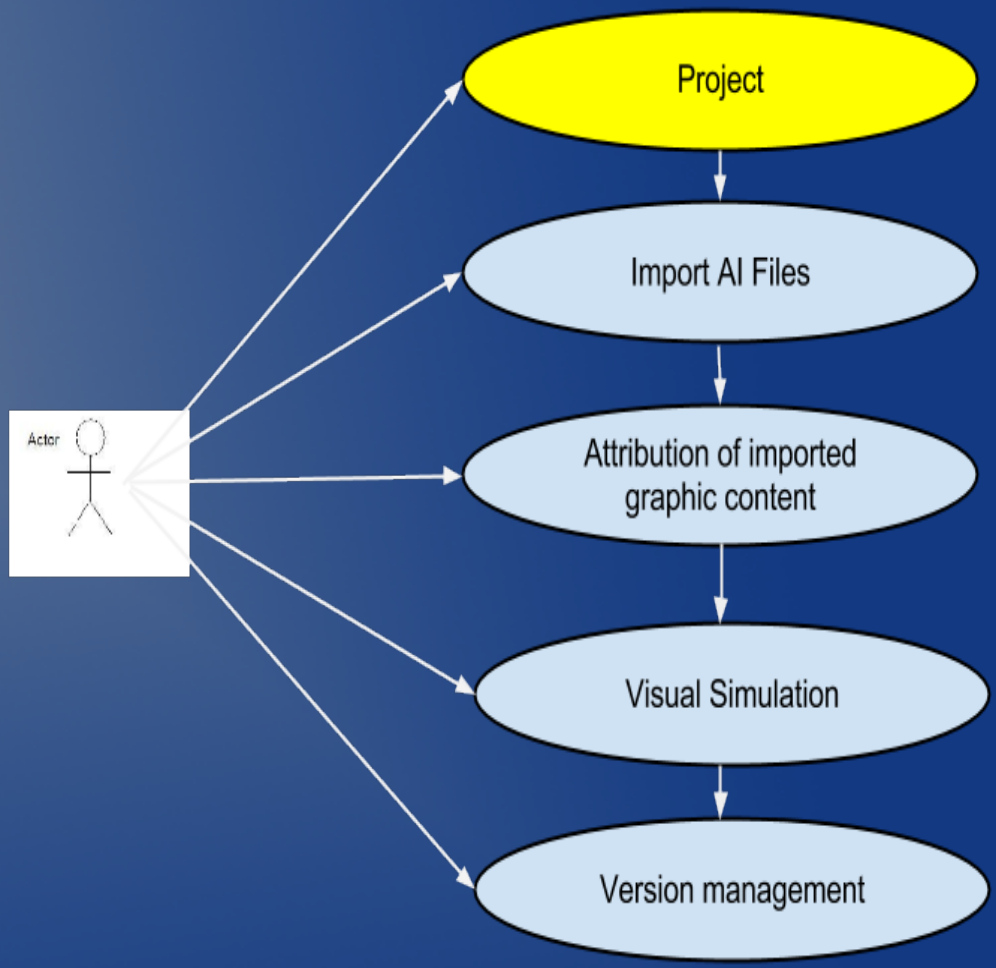
Top-level Use-case of Workbench



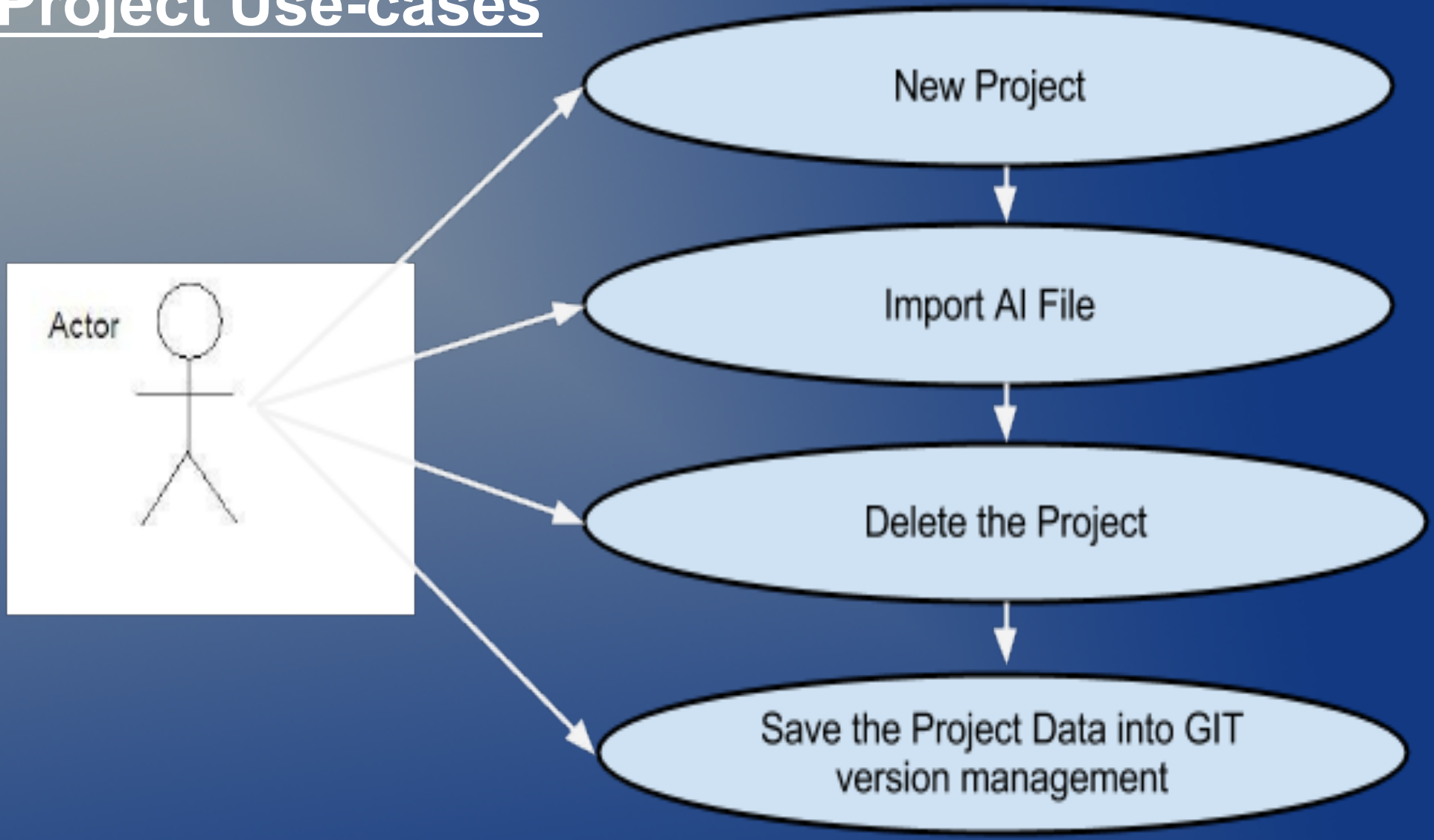
Project

Project is a logical unit that comprises all the information relating to the work / assignment.

The project will help to manage the HMI Designer's work logically. This is similar to any project work space available in an IDE (integrated developer environment) like Microsoft Visual studio.



Project Use-cases



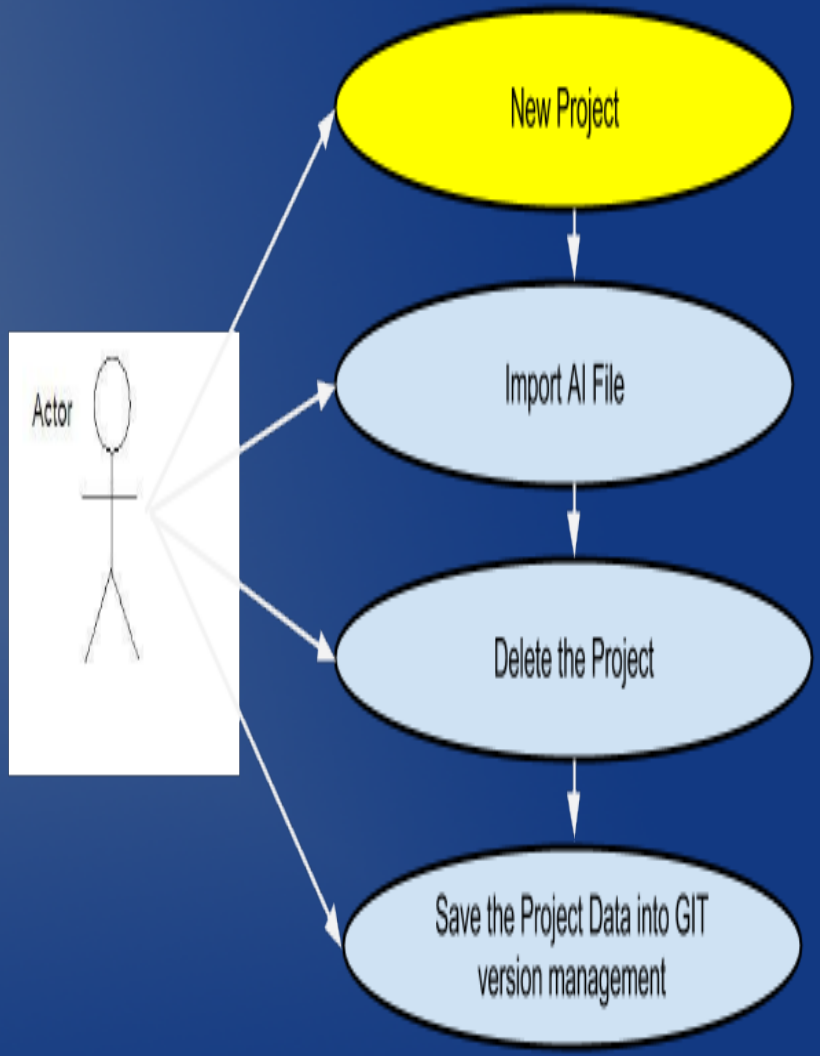
Project Creation

Create a new project.

This is feature to logically define the work space for a HMI Developer. This feature will set the working folder on the desktop. This feature supports the developer to use various tools handy to verify the work product.

Example of project: Audio HMI Screens Cadillac 2.0.

Similarly Delete and save Project are also supported.



Project

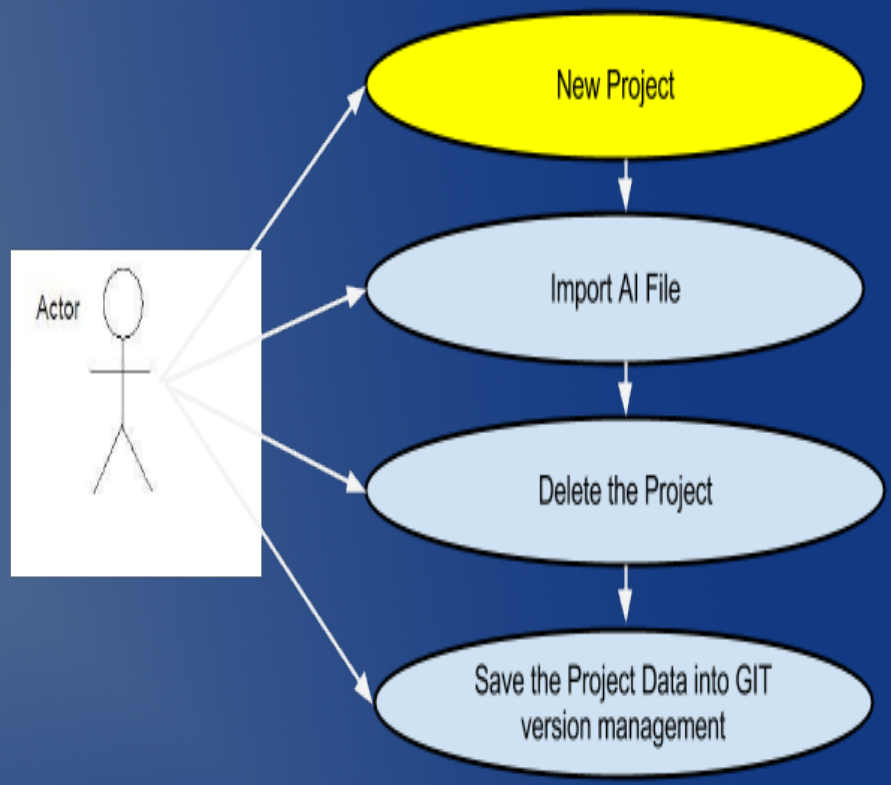
Import a screen from AI File:

Import the extracted AI graphics.

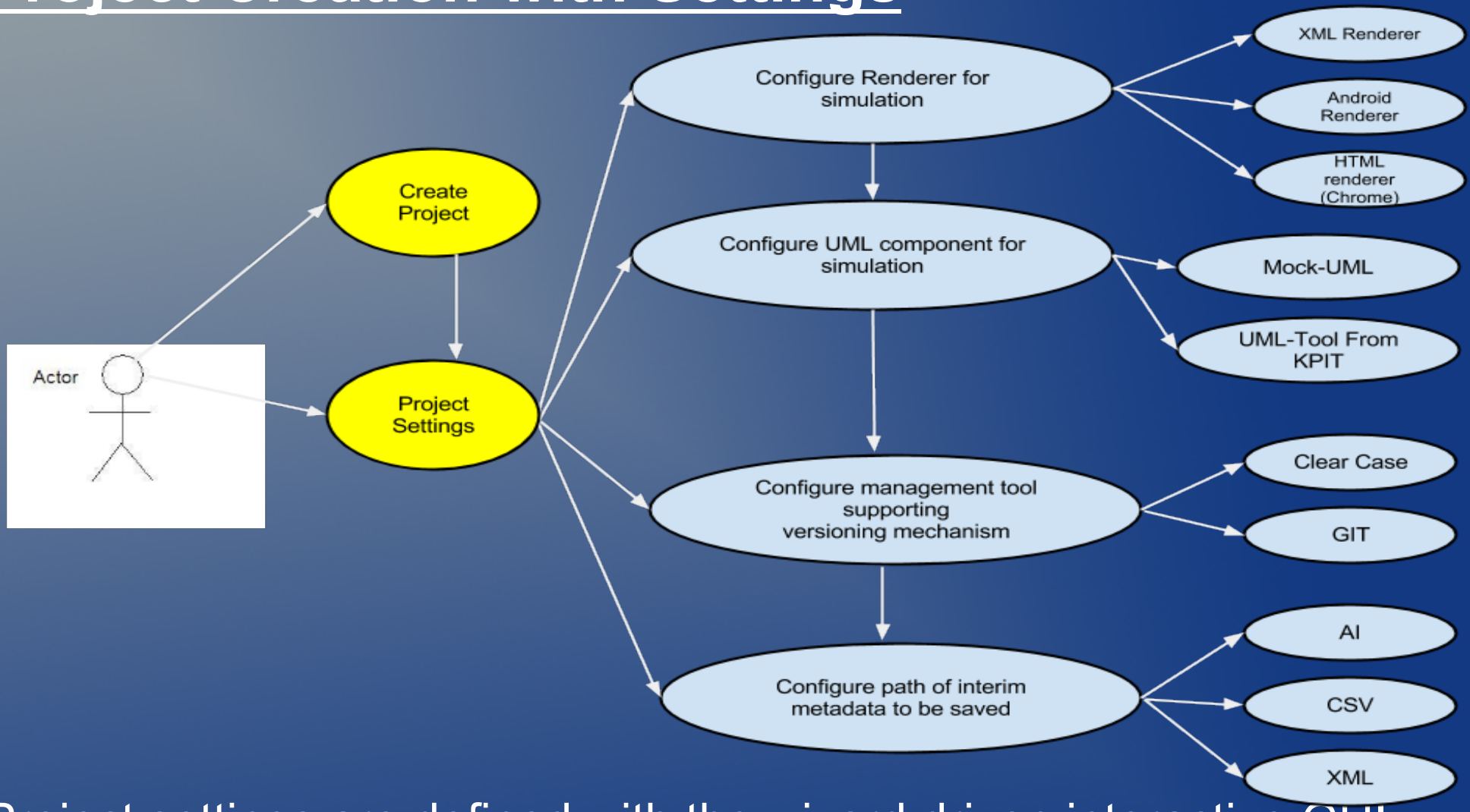
Note: Extraction Process is explained in the next slide.

What is extracted AI?

Graphic designer develop multiple screens. While these screens are submitted to the HMI developers, they are with overlapped cluster of layers in a file. This file needs to be preprocessed by extracting the needed layers as desired screen to import into the workbench.



Project Creation with Settings



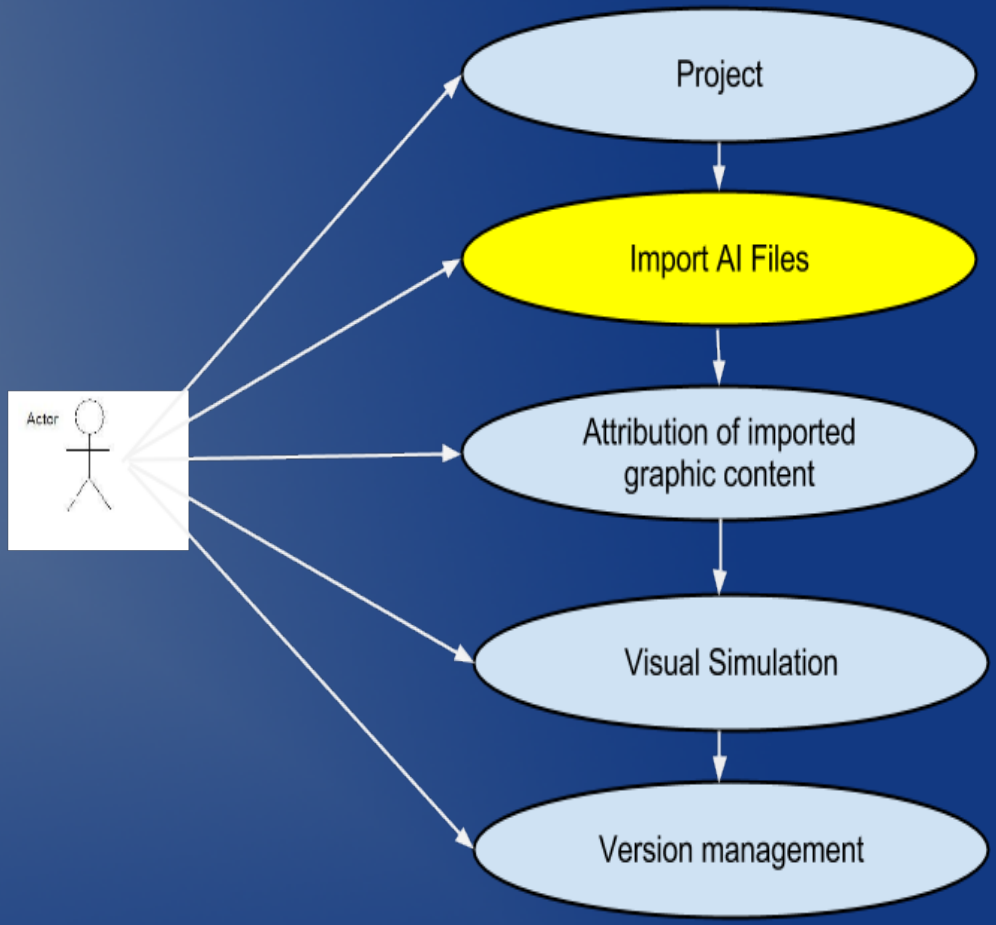
Project settings are defined with the wizard driven interactive GUI.

Ex settings are: Screen Renderer, UML component to support interactions.

Create a screen importing AI file

Creating a screen for HMI using graphic asset files defined by HMI designer. This is done by importing AI file that has graphic asset data.

Currently the workbench can import only extracted asset files of AI.

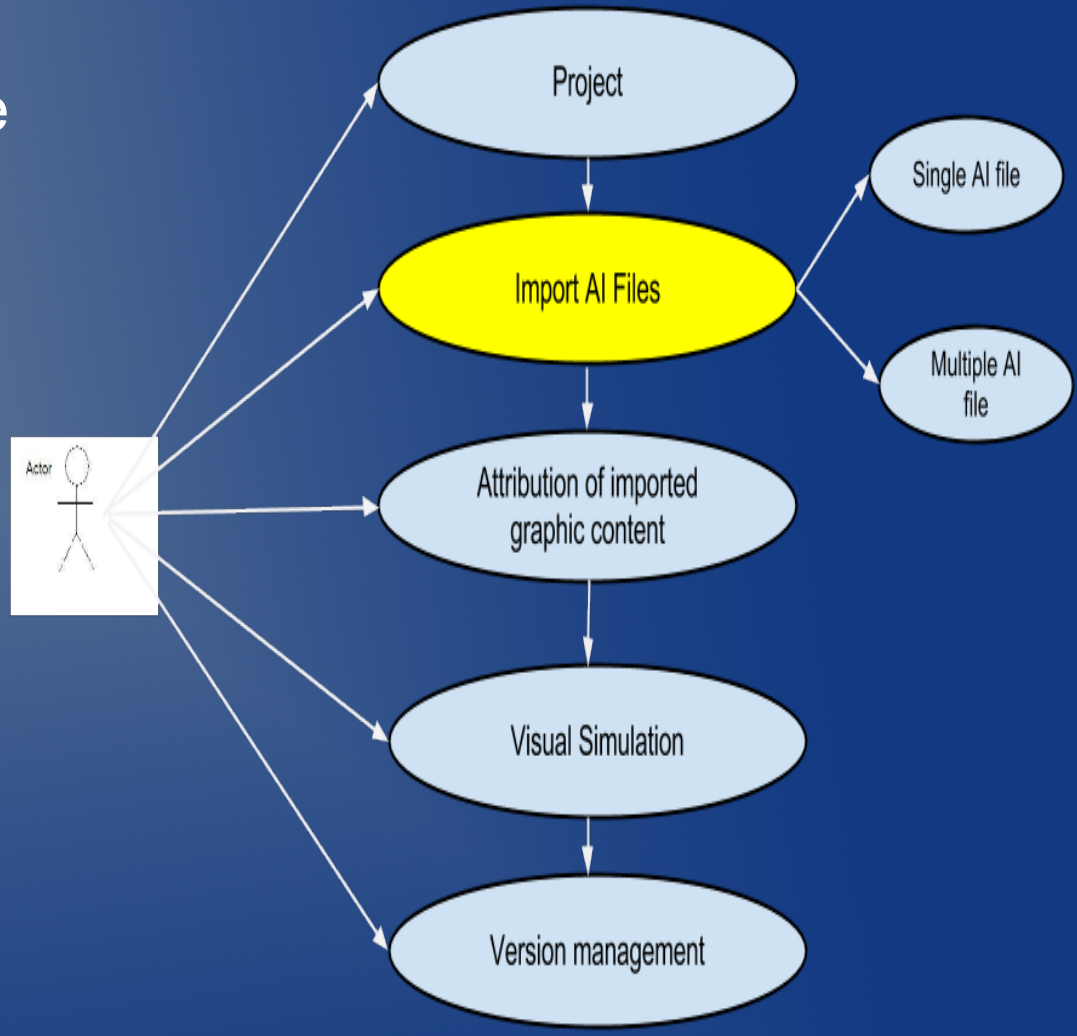


What is extracted AI?

Graphic designer develops multiple screens for HMI. While these screens are stored/ submitted to the HMI developers as overlapped/multi-layers in a file. This file needs to be pre-processed by extracting only the needed layers for a specific screen. This extracted AI file can be imported into workbench to create a screen.

Create a screen importing AI file

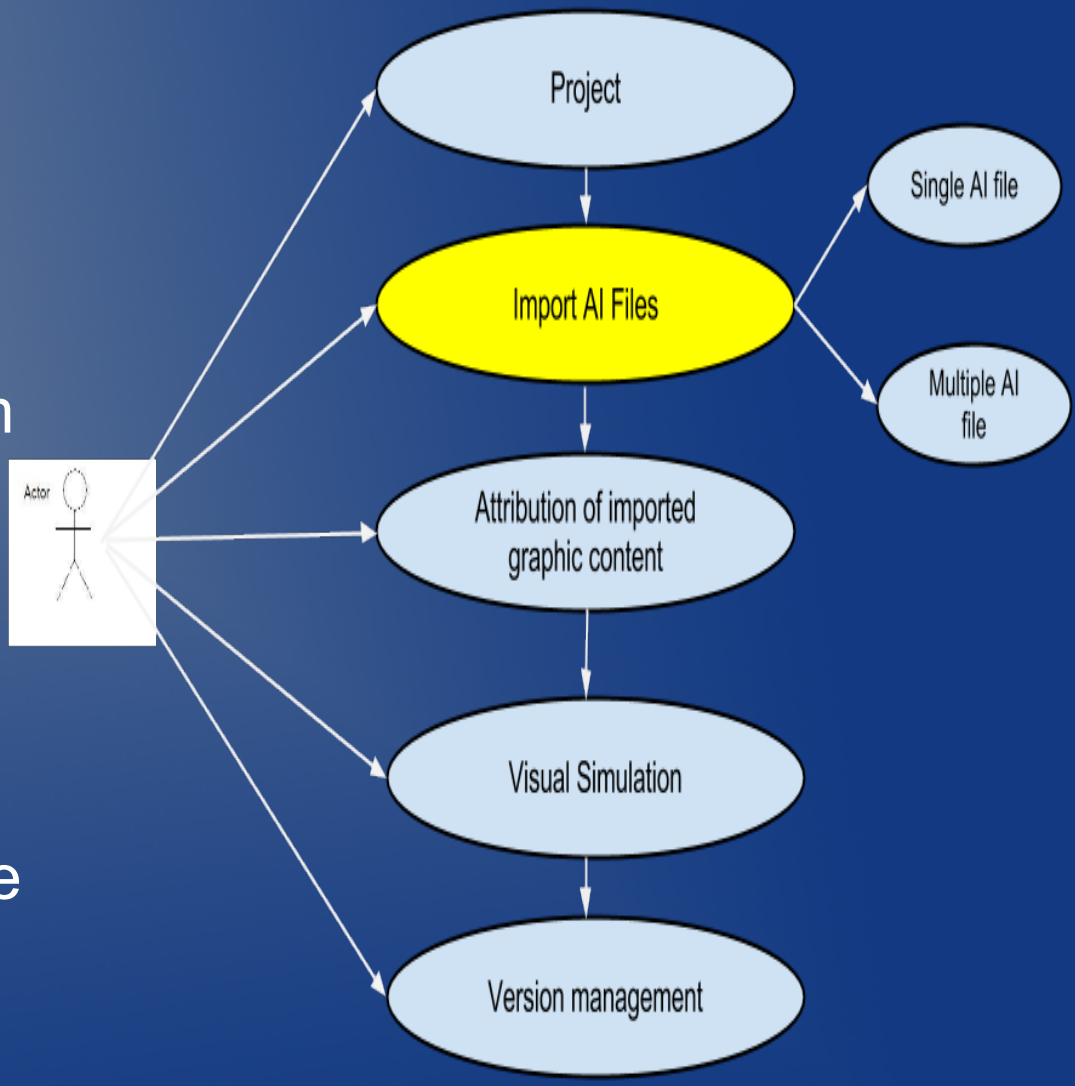
- HMI developer can import one or more AI file(s).
- Import can be performed with or without interactive GUI wizard.
- Wizard supports attribution of the graphic assets to finally launch the simulator for early prototyping.
- Generate the screen info



Create a screen importing AI file

Screens created using an imported AI file

- Using a wizard feature can support attribution for graphical/visual presentation and well as dynamic data from system using specific contract with the data identifiers.
- Without wizard type UI will generate Default Screen Element Info. Attribution of screens can be done using the feature supported from workbench as an explicit step by designer.



Extraction of AI

Below are the guidelines to be followed for the extraction procedure:

Refer to “GIS-400_Uplevel_FBS” for look and appearance of the screens.

The file being extracted from Adobe Illustrator has to be checked with the screen shot provided in GIS document. The look of the screen in GIS and that of the extracted file from illustrator should exactly be the same.

Steps For extraction from Raw AI:

- Anchor position:The anchor as shown should always be set to top left as the reference point for extraction of X, Y, W and H.
- While extracting the required AI file from the raw file:
- a)Open the required AI file in Adobe Illustrator.
- b)Always uncheck the unwanted layers in the layers window
- c)Select and copy the whole left over file or only the required button / image / label.
- d)Open a new artboard from the File menu.
- e)In the new artboard, go to Edit menu and click “Paste in place” option.
- This gives us the original positioning of the layers as required.

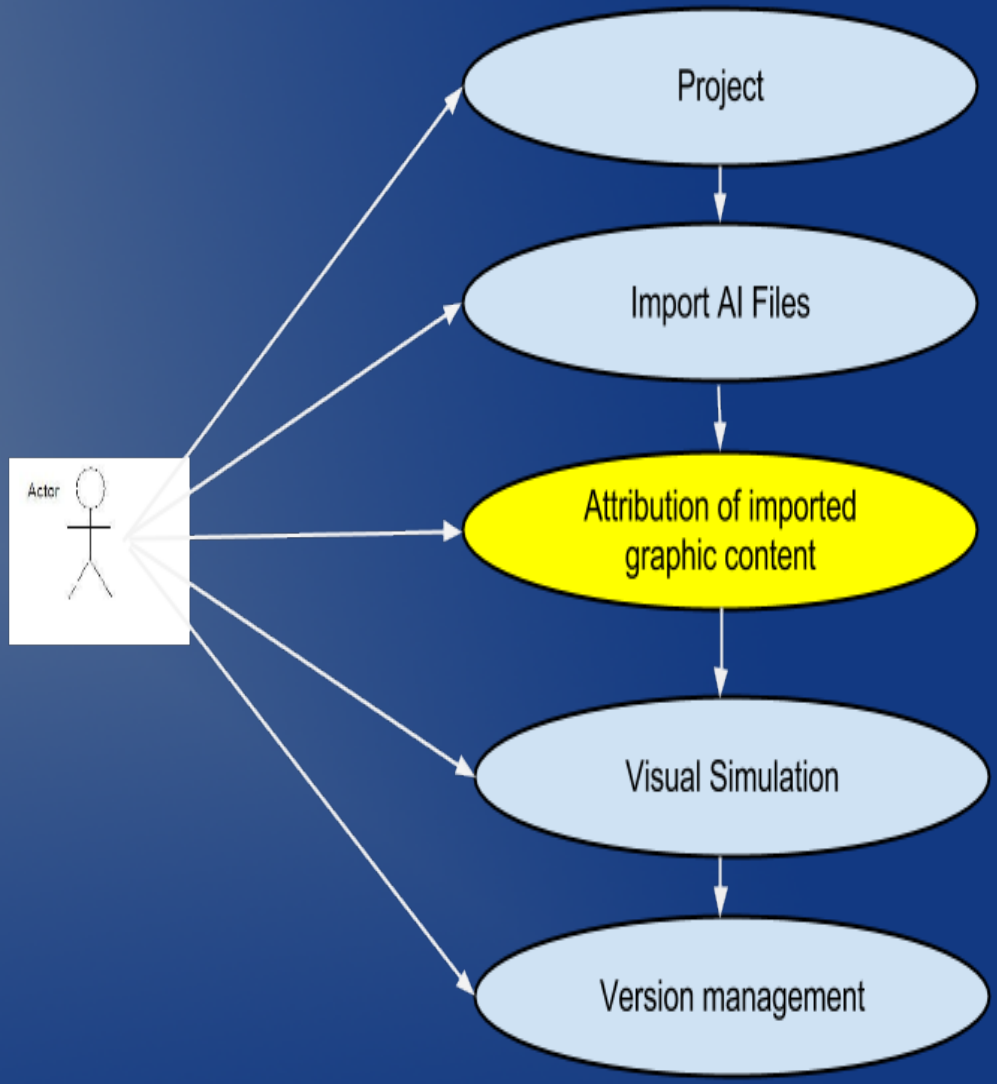
Attribution of Graphic content

Screens designed on Adobe Illustrator do not have all the attributes needed for HMI.

The attributes are of 2 types like:

- Graphic asset attributes
- Dynamic data rendering attributes.

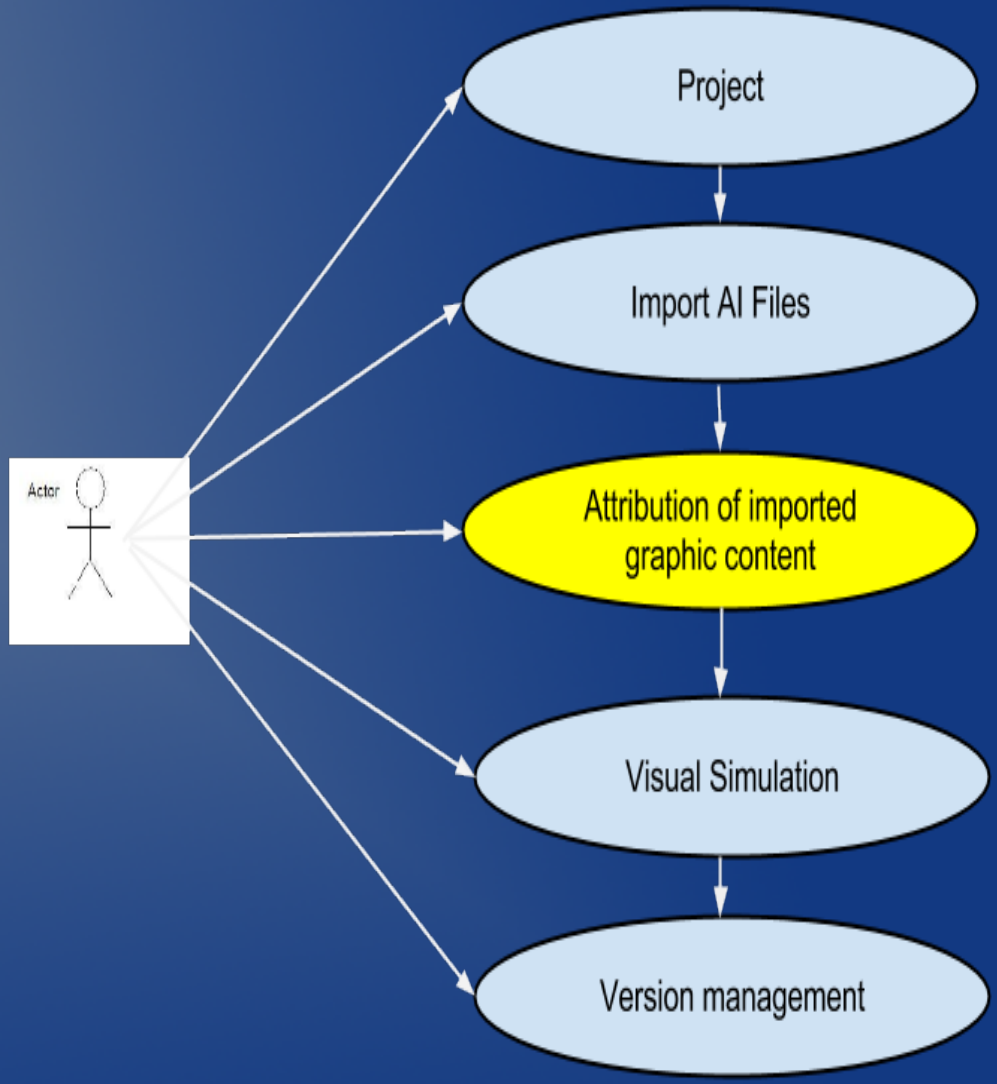
Workbench supports modifying the imported screens by defining/ modifying specific attributes of screens for GM HMI.



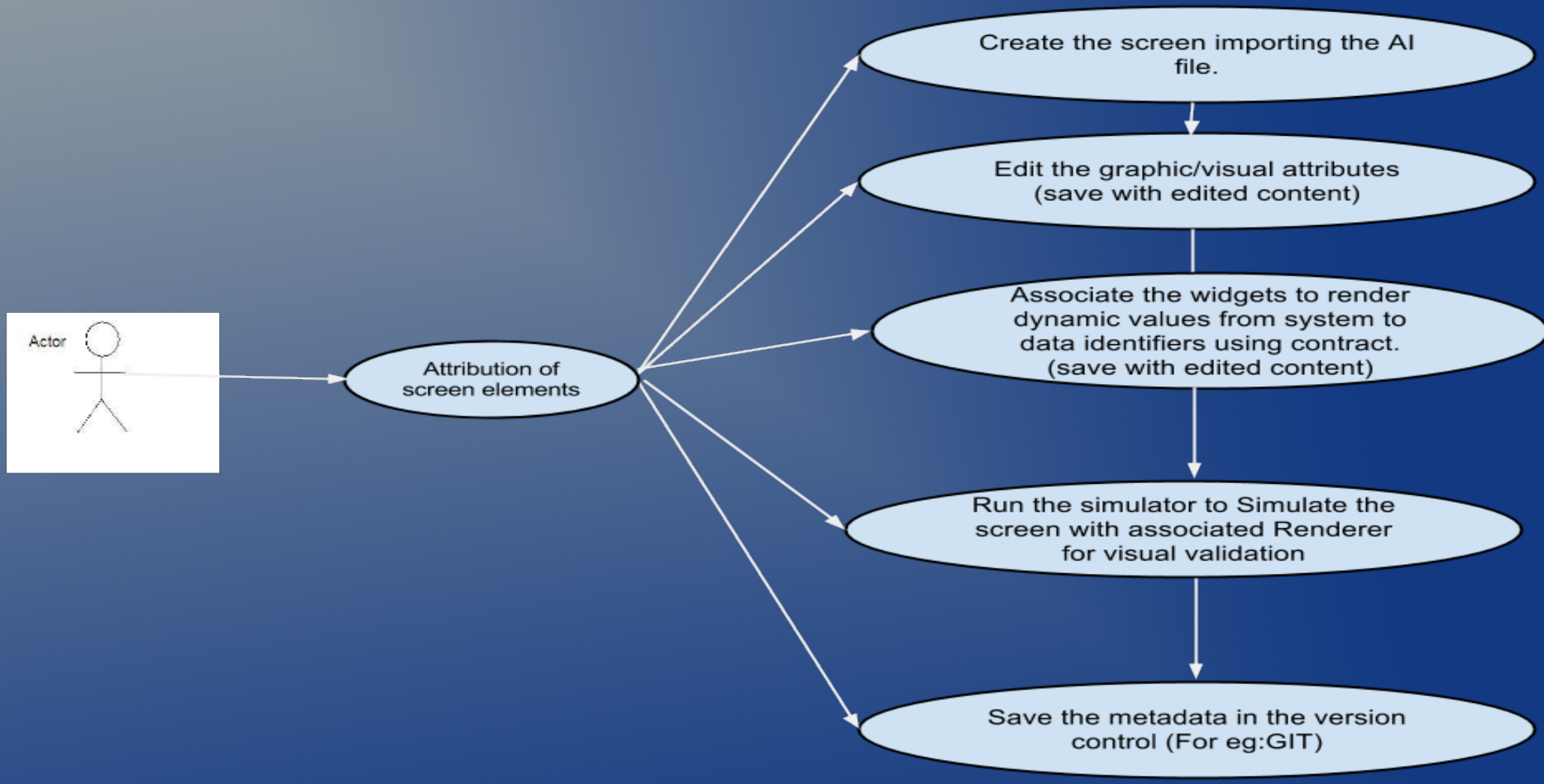
Attribution of Graphic content

Attribution of the graphic content :

- Launches the Visual editor and render the screen.
- After the screen is rendered, visual editor provides to select and edit the attributes of graphic widgets that are not rendered appropriately.
- Dynamic data attributes are edited by the association of the screen contract.
- Launch simulation mode in screen.



3.Attribution of imported graphic content



Visual editor supports editing the graphic widgets attributes of a screen imported from AI.

3. Attribution (Visual attribution)

Graphic widget attributes can be:

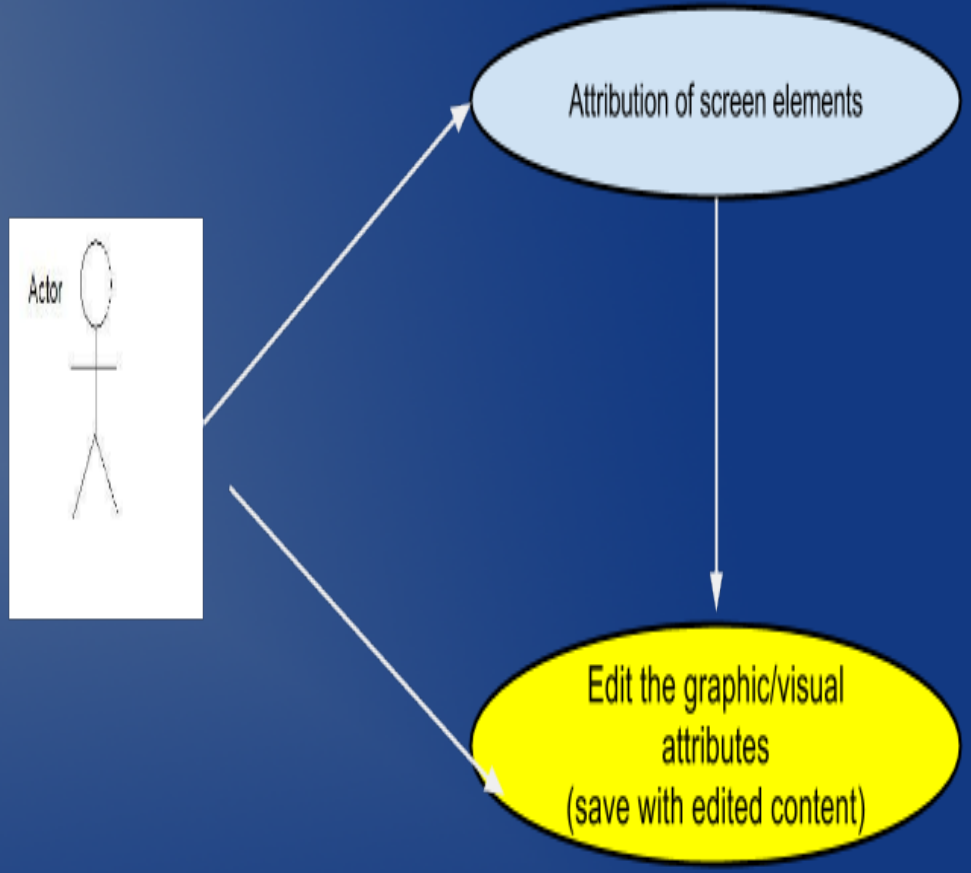
- X,Y,Width and Height values
- Font-type.

e.g. Can Regular,Bold or Italic

- Font-color.

e.g. Can be RGB or CMYK format

- Font-size
- Font-family
- Background color
- Column width ,column height and spacing attribute for the list screen.

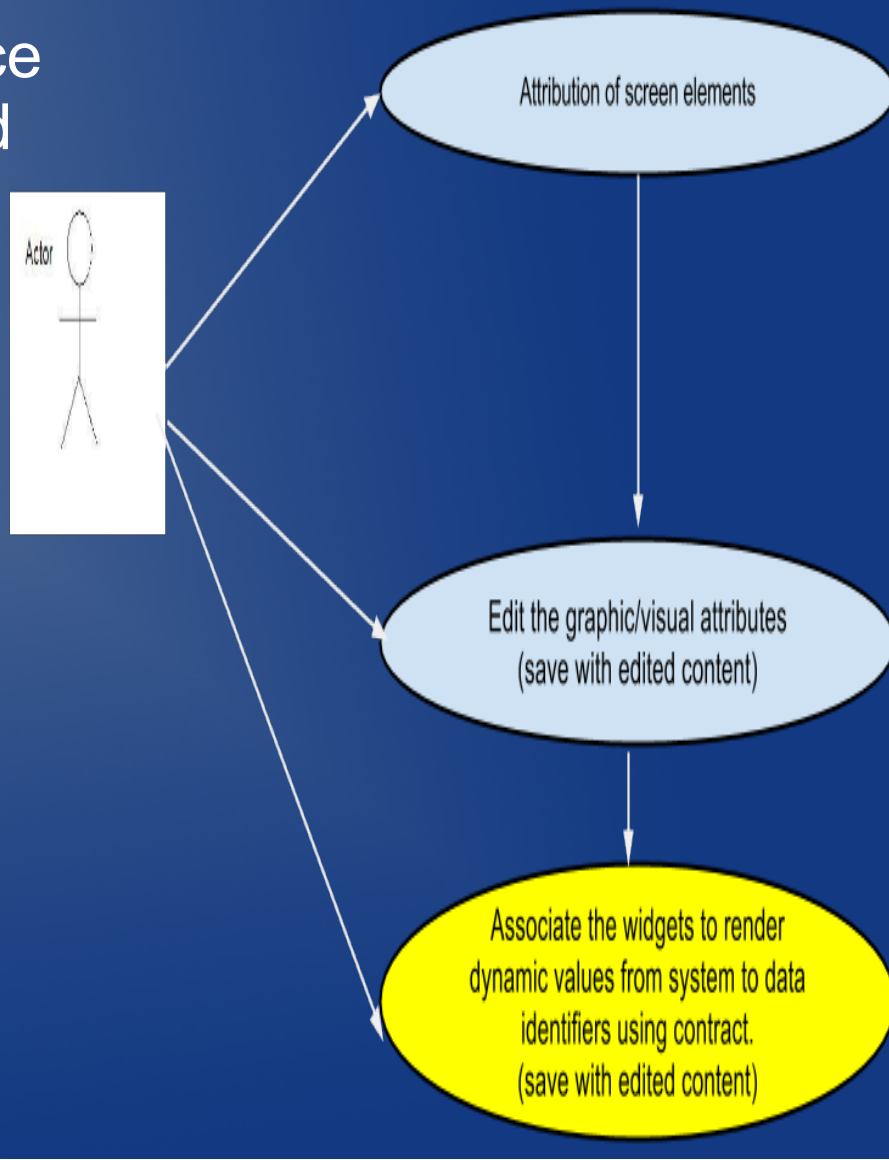


3. Atttribution (Dynamic Data)

Widgets that are used to render system data are identified as dynamic data place holders. These elements are associated with a contract Data Ids. Visual editor provides GUI to choose a contract data id, with the type of dynamic data type (integer, text, image etc).

For e.g:

In AM_Now_playing screen has the element “frequency” dynamically changing which will have dynamic ID in the contract. User can associate screen elements with data identifiers in the contract.



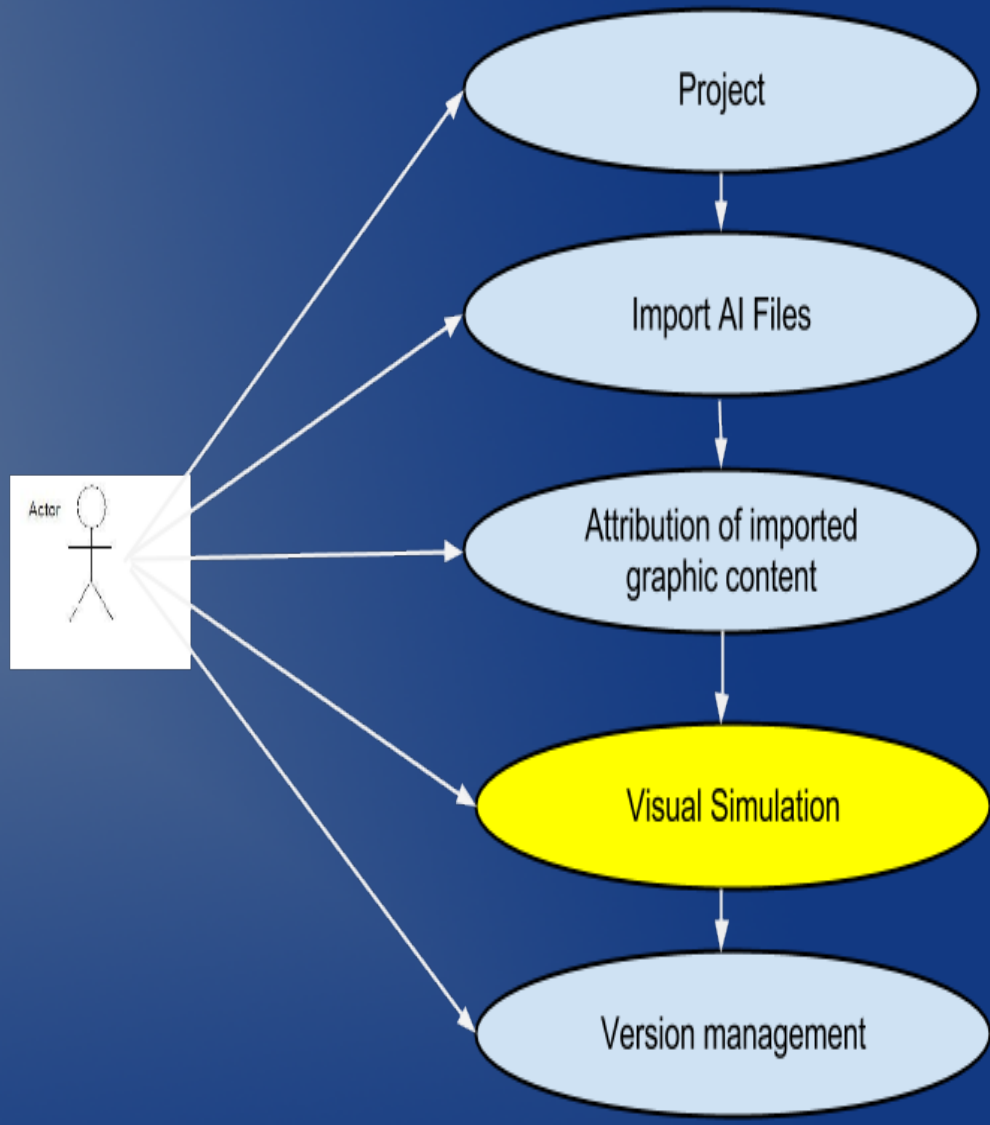
Visual Simulation

Screen can be visually verified by rendering the screen imported on :

XML Renderer

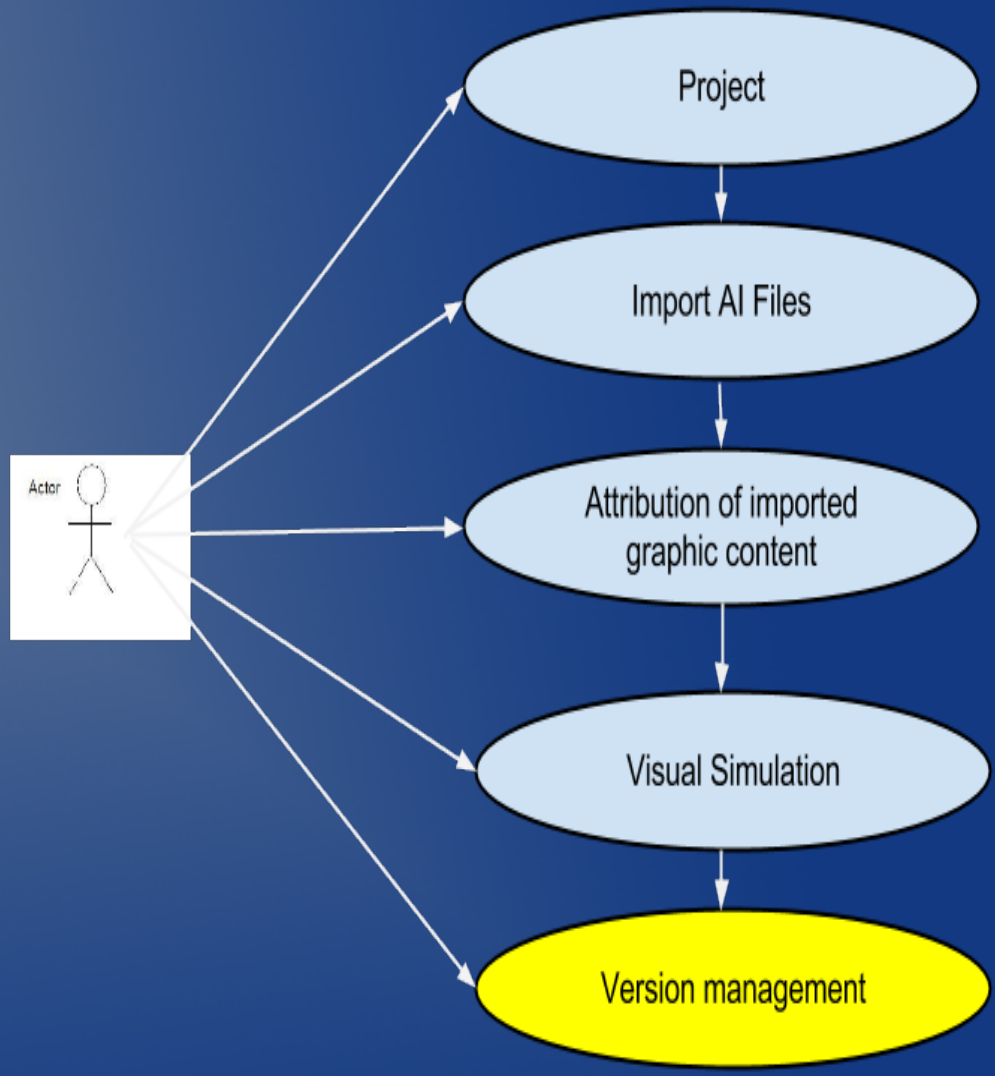
Android Renderer

HTML Renderer(Chrome)

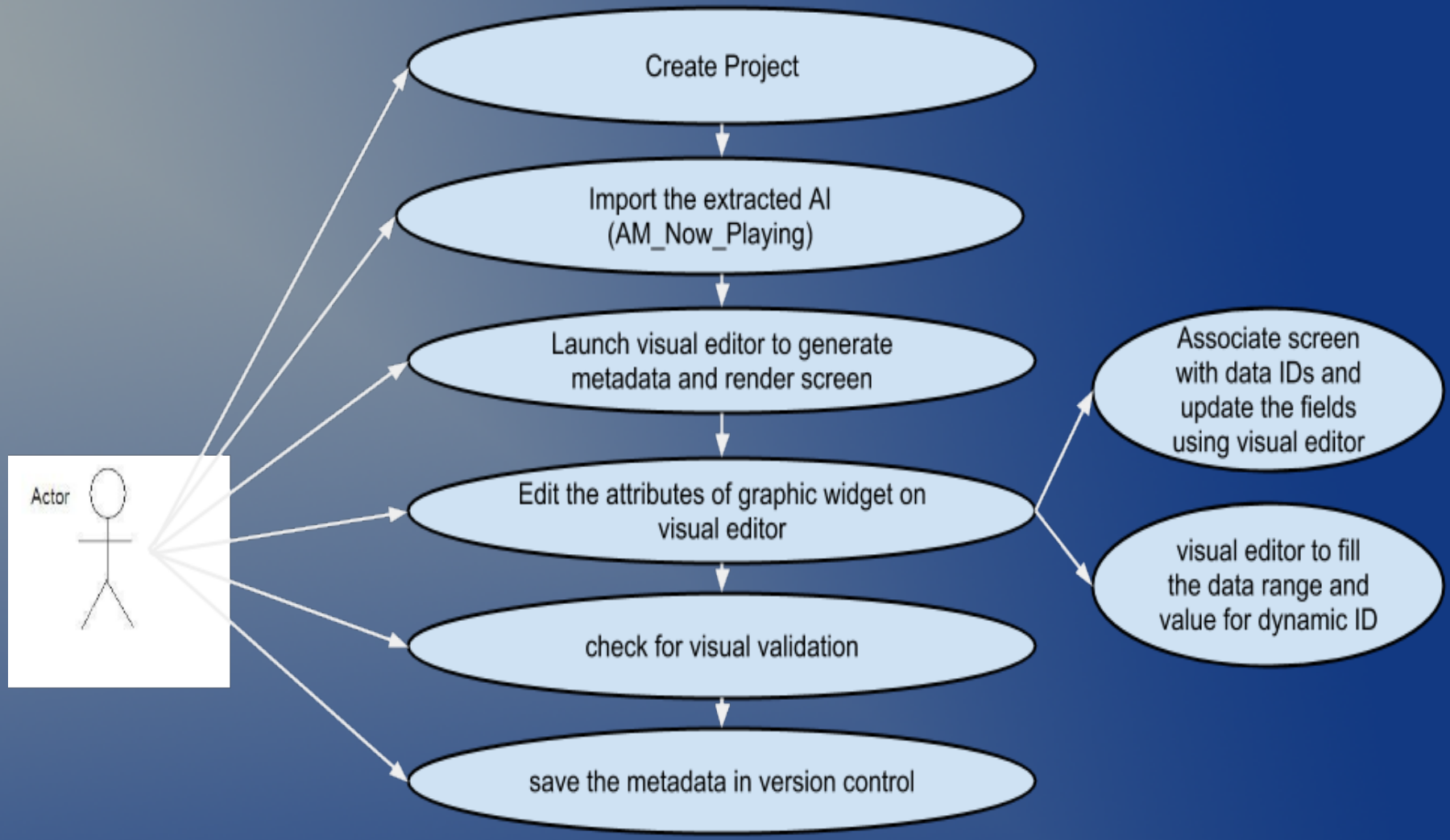


Version Management

- Workbench supports managing the versions and baseline the work products.
- Project settings feature supports config tool.
- The generated metadata are saved into:
  - GIT-HUB
  - Clear case



Case Study



Note: For the extraction ,follow the extraction process mentioned in the Slides.

am_now_play AI screen has static and dynamic data present.

The static data in the screen are:

1.Background image

2.Browse label

3.Browse image

4.Gold-division line

5.AM tower image

The Dynamic data in the screen are:

1.Frequency

2.Short station name

3.HD Radio subscript which has states

4.Song-title name

5.Artist name

Elements with interaction function in the screen:

1.Browse label and image

When the user clicks on this element ,screen is transited to strong_station_list.

2.Dynamic text of label element song,artist and short-station name

When the user clicks on this element ,screen is transited to strong_station_list.

3.Image_metadata region

When the user clicks on this element ,screen is transited to strong_station_list.

Attributes of graphic widgets includes:

The attributes of static graphic widget for label includes:

1.font-family

2.font-name

3.font-color

4.font-size

5.font-type

6.text-align

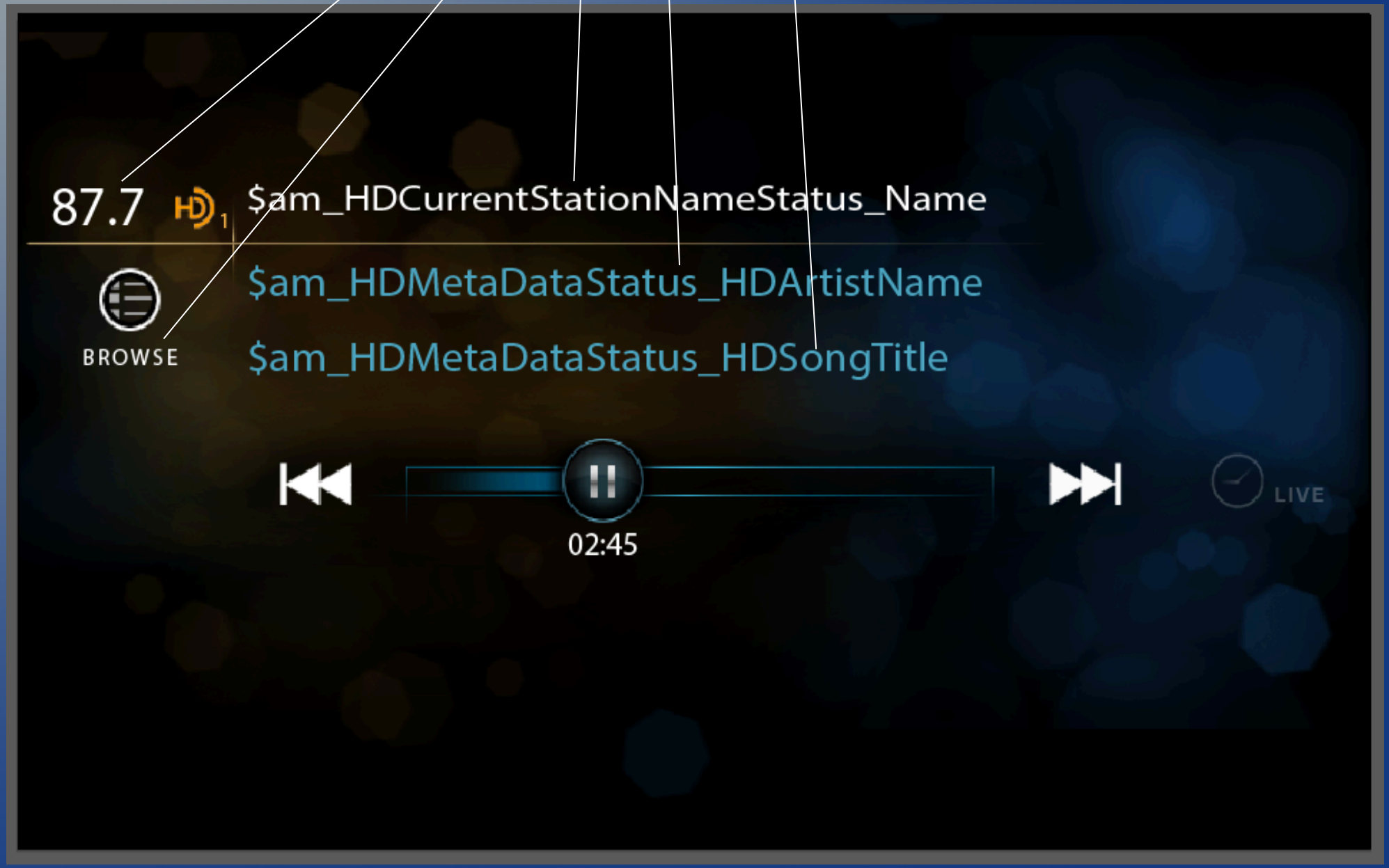
7.truncation-type

8.truncation-suffix

9.rotation time

10.background color

Graphic widget attribute



The Dynamic Data values

Dynamic data can be presented by:

1. Associating the Contract for dynamic Ids before importing AI.
2. Providing the text field to enter the value for dynamic elements and check for visual validation.

Interaction elements for screen transition

Provide an edit field to enter the user-event attribute to the Browse element and metadata region which on click transit to strong station list.

Simulation

1. Run the visual editor to check for visual validation.
2. save the metadata in the version control.

Contract widget attribute